

# MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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## INTRODUCTION.

The MONTHLY WEATHER REVIEW for March, 1899, is based on about 2,762 reports from stations occupied by regular and voluntary observers, classified as follows: 162 from Weather Bureau stations; numerous special river stations; 32 from post surgeons, received through the Surgeon General, United States Army; 2,385 from voluntary observers; 96 received through the Southern Pacific Railway Company; 29 from Life-Saving stations, received through the Superintendent United States Life-Saving Service; 31 from Canadian stations; 10 from Mexican stations; 7 from Jamaica, W. I. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Dr. Mariano Bárcena, Director of the Central Meteorological and Magnetic Observatory of Mexico; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kim-

ball, Superintendent of the United States Life-Saving Service; and Capt. J. E. Craig, Hydrographer, United States Navy.

The REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local meridian is mentioned.

## FORECASTS AND WARNINGS.

By Prof. E. B. GARBIOTT, in charge of Forecast Division.

The weather changes and conditions during March, 1899, did not vary materially from the seasonal average. The principal cold wave of the month crossed the country east of the Rocky Mountains from the 4th to the 7th, causing frost and freezing weather in the Gulf and South Atlantic States during the 6th and 7th.

Three well-marked and energetic storms visited the Atlantic seaboard. One of these developed off the North Carolina coast on the 6th and moved northeastward along the middle Atlantic and New England coasts during the 6th and 7th, attended by winds of from 50 to 60 miles an hour. From the 15th to the 19th a storm traversed the country from the middle Pacific coast to New England. This storm developed great strength while crossing the central valleys and showed barometric readings below 29.00 inches on the New England coast, with winds 40 to 50 miles an hour along the entire Atlantic coast and a maximum velocity of 72 miles per hour from the northwest at New York City. The third storm of the month moved from the West Gulf States to New England from the 27th to the 29th. On the morning of the 29th the barometer at Portland, Me., read 28.90 inches, and gales of from 50 to 60 miles an hour prevailed along the Atlantic coast.

In anticipation of the frosts which occurred on the 10th, 11th, and 12th, special frost warnings were issued for California by the San Francisco office of the Weather Bureau, on March 9.

Special flood warnings were issued from Portland, Oreg., on the 2d and from San Francisco on the 24th.

No special injury is known to have been caused by the cold wave, frosts, and storms referred to, and no special benefits are known to have resulted from the timely and ample warnings issued in connection with their occurrence.

## CHICAGO FORECAST DISTRICT.

The weather conditions during March were governed by frequent storms which moved from the Pacific coast across the Rockies, and then passed thence to the southeast or east. This feature resulted in unseasonably cold weather.

On the morning of the 5th, on account of the appearance of an area of high barometer of great magnitude over the extreme Northwest, the following special message was sent to the observers in Minnesota, Wisconsin, Illinois, Indiana, Missouri, Iowa, Upper and Lower Michigan, and extreme eastern Nebraska:

Unseasonably cold weather indicated for your section to-night and Monday; notify interests.

During the morning of the 10th another cold wave developed in the British Northwest. At the same time a well-marked storm was over Kansas, which, during the succeeding forty-eight hours, moved northeastward over the Lake region.